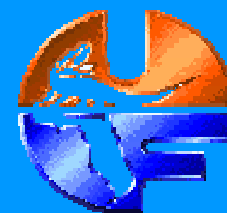




mcProduction Update



➔ **mcProduction WEBSITE:** (maintained by Frank Würthwein)

<http://www-cdf.fnal.gov/internal/mcProduction/>

➔ **mcProduction WEBSITE:** Requesting a Monte-Carlo Run

- ☐ Build our standard exe tarball for the farm.
- ☐ Test your tcl file with the standard exe tarball you created above.
- ☐ Verify that runMC executable is ok for you.
- ☐ Now you're ready for us to do some work for you.

➔ **mcProduction WEBSITE MC generated 4.2.0:**

- ☐ Pythia W->ev run number 85979; runMC was patched extensively. CVS tag useWithv4_2_0 for mcProduction.

➔ **mcProduction WEBSITE MC generated 4.3.0:**

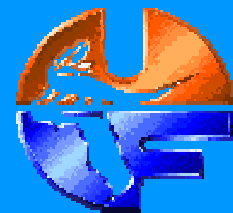
- ☐ Pythia W->μν run number 85978; runMC based on 4.3.0pre1 using cvs tag v4_3_0pre2 for mcProduction.
- ☐ Pythia Z->ee on-shell run number 85977; runMC based on 4.3.0pre1 using cvs tag v4_3_0pre2 for mcProduction.
- ☐ Pythia Z->μμ on-shell run number 85976; runMC based on 4.3.0pre1 using cvs tag v4_3_0pre2 for mcProduction.
- ☐ Pythia WW generic run number 85975; runMC based on 4.3.0pre1 using cvs tag v4_3_0pre2 for mcProduction.
- ☐ Pythia drell-yan Z->ee run number 85974; runMC based on 4.3.0pre1 using cvs tag v4_3_0pre2 for mcProduction.
- ☐ Pythia drell-yan Z->μμ run number 85973; runMC based on 4.3.0pre1 using cvs tag v4_3_0pre2 for mcProduction.

➔ **mcProduction Code-Browser:**

<http://cdfcodebrowser.fnal.gov/CdfCode/source/mcProduction/tcl/>



mcProduction News

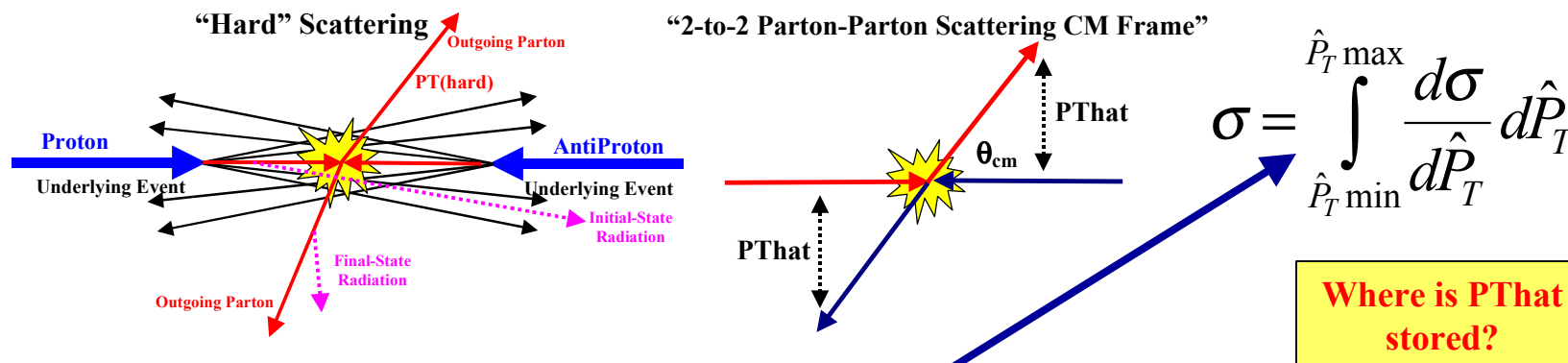
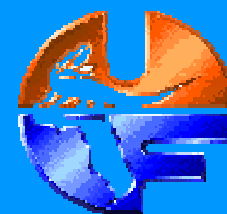


Recent E-mail from messages
mcProduction

- ➔ **runMC in 4.3.0 is not working because of changes from 4.3.0pre1 to 4.3.0pre2. This would be very unfortunate if there was massive interest in generating MC. As it stands the only outstanding requests are one from Susana Cabrera and one from the QCD group (Frank Würthwein, *January 21, 2002*).**
- ➔ **Some problems have been fixed in SiClusterFinder but our problem is not among them. i.e. runMC still dumps core on exit in 4.3.0int2. WE WILL NOT ATTEMPT FURTHER MONTE CARLO GENERATION UNTIL THIS BUG IS FIXED (Frank Würthwein, *January 26, 2002*).**
- ➔ **David Waters noticed that some of the MC files we generated were written to tape twice. The reason why this happened is understood. There is a script that needs to be run by hand by the person who operates the farm. It appears as if two people ran that script shortly after another, catching some files twice on different tapes. This will be straightened out before we run the next time on the farm (Frank Würthwein, *January 26, 2002*).**
- ➔ **4.4.0 runMC executable in the mcProduction package will still have a memory problem when running Pythia. However, herwig works and can be used to generate events on the FCC farm (Tony Vaiciulis, *February 15, 2002*).**



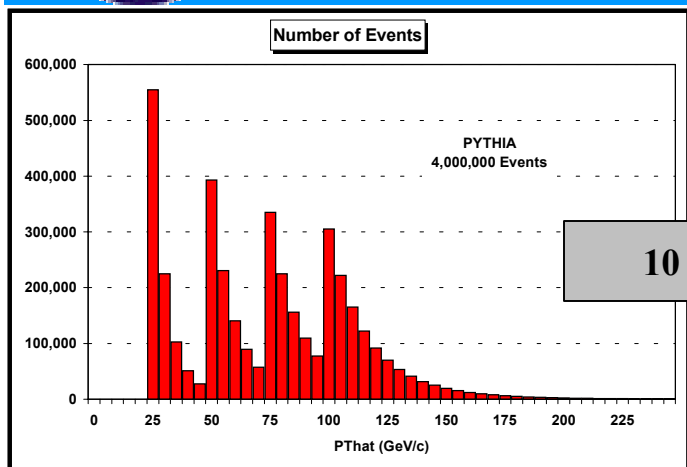
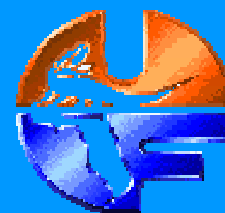
Monte-Carlo Generators



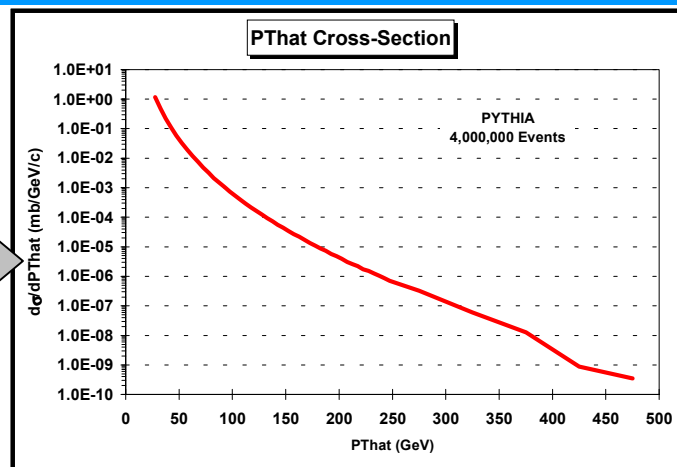
- ➔ Monte-Carlo generation is simply an integral over P_{That} from $P_{That}(\min)$ to $P_{That}(\max)$.
- ➔ P_{That} is not an experimental observable. It is an internal Monte-Carlo parameter.
- ➔ It cannot be deduced (*in any simple way*) from a list of the generated partons even if the list includes the virtual and real partons. I do not believe it is stored in the **HEPG** bank?
- ➔ One needs to know P_{That} on an event-by-event bases in order to produce weighted histograms.
- ➔ It might also be nice to keep track of other parton level quantities like θ_{cm} and the subprocess type.



Weighted MC Generation



10 decades!



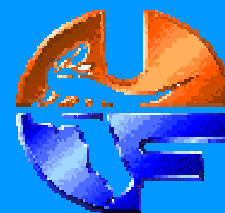
- ➔ $N_1 = 1,000,000$ $25 < P_{\text{That}} < 900$ GeV/c: $\sigma_1 = 10.7$ mb, $L_1 = N_1/\sigma_1 = 9.3 \times 10^4/\text{mb}$
- ➔ $N_2 = 1,000,000$ $50 < P_{\text{That}} < 900$ GeV/c: $\sigma_2 = 0.44$ mb, $L_2 = N_2/\sigma_2 = 2.3 \times 10^6/\text{mb}$
- ➔ $N_3 = 1,000,000$ $75 < P_{\text{That}} < 900$ GeV/c: $\sigma_3 = 0.054$ mb, $L_3 = N_3/\sigma_3 = 1.9 \times 10^7/\text{mb}$
- ➔ $N_4 = 1,000,000$ $100 < P_{\text{That}} < 900$ GeV/c: $\sigma_4 = 0.011$ mb, $L_4 = N_4/\sigma_4 = 9.1 \times 10^7/\text{mb}$
- ➔ $25 < P_{\text{That}} < 50$ GeV/c: weight = $1/L_1$
- ➔ $50 < P_{\text{That}} < 75$ GeV/c: weight = $1/(L_1+L_2)$
- ➔ $75 < P_{\text{That}} < 100$ GeV/c: weight = $1/(L_1+L_2+L_3)$
- ➔ $P_{\text{That}} > 100$ GeV/c: weight = $1/(L_1+L_2+L_3+L_4)$

Need to know
PThat for
each event!

Need to know
luminosity, L,
and
PThat(max,min)
each run!



mcProduction Plans



- ➔ I need to find out where PThat is stored (**I do not think it is in HEPG?**).
- ➔ We need to store PThat (and maybe other parton level information) on an event-by-event basis and store the luminosity and PThat(min,max) on a run-by-run basis.
- ➔ A histogram of PThat should be included in the QCD validation module.
- ➔ I will try and set up the tcl files and request mcProduction to do perhaps 6 (or 8) runs of ordinary QCD that cover the entire PThat range in intervals so that we can do weighted histograms (PYTHIA and HERWIG).
- ➔ Rob has requested runs of ordinary QCD with the parton cuts set at the level 1 trigger thresholds, but the weighted method is better.
- ➔ Joey, Jay, and I need to know the needs (*requests*) of the QCD group.
- ➔ There is a **MC workshop on March 12**. The goal is not to wait until all issues can be addressed and solved, but to have a series of workshops, each addressing current simulation and MC farm production issues of concern to the physics groups.
- ➔ Are you sure I am the right person to represent the QCD group in mcProduction?
 - ☐ I have learned how to set-up the “tickle” files for the MC generators.
 - ☐ I have run one PYTHIA job (1,000 events) at UF with the CDF software.
 - ☐ I have not yet run the full mcProduction package.
 - ☐ I don't yet know how to make histograms from the output files.

